

AMENDMENTS TO THE CLAIMS

Claims 1-16 (Canceled)

Claim 17 (Currently Amended) A refrigerating storage cabinet for refrigerating an inner atmosphere and including a refrigeration unit ~~comprising having~~ a compressor and an evaporator, the compressor including a plurality of performance levels, in which the refrigerating storage cabinet ~~comprises~~comprising:

a storing ~~means for storing~~unit configured to store a cooling characteristic ~~comprising~~including a target physical amount as a function of operating time;

a physical amount sensor ~~able~~configured to detect a physical amount, ~~corresponding to the target physical amount~~, at predetermined intervals of operating time; and

~~wherein the compressor comprises a plurality of performance levels;~~

an operation control ~~means for controlling~~unit configured to control the compressor by selecting ~~an appropriate~~ one of the plurality of performance levels based upon a relationship between the physical amount and the target physical amount for ~~a corresponding one of the predetermined intervals of~~ operating time.

Claim 18 (Currently Amended) The refrigerating storage cabinet of claim 17, wherein:

the physical amount is a temperature of the inner atmosphere; ~~and~~

the target physical amount ~~are~~is a temperature~~temperatures~~;

~~wherein the physical amount is the temperature of the inner atmosphere;~~

~~wherein the compressor is controlled by the operation control means in which the cooling characteristic is a pull down characteristic while~~and the physical amount is in a temperature range from above a high temperature to near a set temperature; and

~~wherein the high temperature is higher than the set temperature by more than a predetermined value.~~

Claim 19 (Currently Amended) The refrigerating storage cabinet of claim 18, further comprising:

an upper limit temperature that is higher by the predetermined value than ~~the~~ set temperature;

a lower limit temperature that is lower by the predetermined value than the set temperature;

a control-cooling zone between and including the upper limit temperature ~~to~~ and the lower limit temperature;

wherein when the physical amount is in the control-cooling zone from the upper limit temperature to the lower limit temperature, the cooling characteristic is a control-cooling characteristic;

~~wherein the compressor is controlled by the operation control means wherein the control characteristic is a control-cooling characteristic when the physical amount is in the control-cooling zone from the upper limit temperature to the lower limit temperature;~~

wherein when the physical amount reaches the lower limit temperature from a temperature higher than the lower limit temperature, the compressor is not operated; and

wherein when the physical amount reaches the upper limit temperature from a temperature lower than the upper limit temperature, the compressor is operationally controlled by the operation control ~~means~~ unit.

Claim 20 (Currently Amended) The refrigerating storage cabinet according to claim 19, ~~characterized in that~~ wherein the compressor is a speed-controllable inverter compressor, and the operation control ~~means~~ unit comprises:

a physical amount change computing section ~~computing~~ configured to compute a physical amount reduction degree at the predetermined intervals of operating time;

a target physical amount reduction degree output section ~~providing~~ configured to provide a target physical amount reduction degree corresponding to the predetermined intervals of operating time;

a comparing section ~~for comparing~~ configured to compare the physical amount reduction degree to the target physical amount reduction degree at ~~a corresponding operation~~ one of the predetermined intervals of operating time; and

a speed control section ~~controlling~~configured to control the inverter compressor so that a rotational speed of the inverter compressor is increased when the comparing section indicates that the physical amount reduction degree is smaller than the target physical amount reduction degree, and decreasing the rotational speed of the inverter compressor when the comparing section indicates that the actual physical amount reduction degree is larger than the target physical amount reduction degree.

Claim 21 (Currently Amended) The refrigerating storage cabinet according to claim 20, ~~characterized in that~~wherein the pull down characteristic is a linear function; and
wherein the target physical amount reduction degree is a constant value.

Claim 22 (Currently Amended) The refrigerating storage cabinet according to claim 21, ~~characterized in that~~wherein the control-cooling characteristic is a linear function;
~~wherein the target physical amount reduction degree is a constant value.~~

Claim 23 (Currently Amended) The refrigerating storage cabinet of claim 20, ~~characterized in that~~wherein the control-cooling characteristic is a linear function.

Claim 24 (Currently Amended) The refrigerating storage cabinet of claim 20, ~~characterized in that~~wherein the control-cooling characteristic is a quadratic function; and
wherein the pull down characteristic is a quadratic function.

Claim 25 (Currently Amended) The refrigerating storage cabinet of claim 20, ~~characterized in that~~wherein the control-cooling characteristic is represented as an exponential function; and
wherein the pull down characteristic is an exponential function.

Claim 26 (Currently Amended) The refrigerating storage cabinet of claim 20, further ~~characterized by~~comprising:

a reference table in which ~~the~~each target physical amount reduction degrees ~~have~~have degree

has been determined for a plurality of target physical amounts and stored in the reference table according to an associated target physical amount;

~~an appropriate target physical amount reduction degree is retrieved by wherein~~ the target physical amount reduction degree output section provides the target physical amount reduction degree by retrieving an appropriate target physical amount reduction degree from the reference table from the target reduction table based on a correspondence between the physical amount and the associated target physical amount;

a physical amount change computing section ~~computing configured to compute~~ a physical amount reduction degree for the physical amount based on the physical amount and a previously measured physical amount;

wherein the physical amount reduction degree and the appropriate target physical amount reduction degree are used as inputs for the comparing section.

Claim 27 (Currently Amended) The refrigerating storage cabinet of claim 19, ~~characterized in that wherein~~ the control-cooling characteristic is a quadratic function.

Claim 28 (Currently Amended) The refrigerating storage cabinet of claim 19, ~~characterized in that wherein~~ the control-cooling characteristic is ~~represented as an~~ exponential function.

Claim 29 (Currently Amended) The refrigerating storage cabinet of claim 20, wherein the ~~pull down cooling zone~~ control-cooling characteristic includes a first pull down zone and a second pull down zone;

wherein the pull down characteristic includes a first pull down characteristic and a second pull down characteristic

wherein the first pull down characteristic is used for the first pull down zone and is a linear function;

wherein the second pull down characteristic is used for the second pull down part and is a quadratic function.

Claim 30 (Currently Amended) The refrigerating storage cabinet of claim 17, wherein ~~the said storing means-unit stores-is configured to store~~ a plurality of the cooling characteristics; and

wherein ~~the said operation control means-executes-unit is configured to execute an~~ appropriate one of the cooling characteristics based upon the physical amount.

Claim 31 (Currently Amended) The refrigerating storage cabinet of claim 18, ~~characterized in that~~ wherein a plurality of the pull down ~~cooling~~-characteristics is provided; and

wherein an appropriate one of the plurality of the pull down ~~cooling~~-characteristics is executed based on the physical amount.

Claim 32 (Currently Amended) The refrigerating storage cabinet of claim 31, wherein the appropriate one of the plurality of the pull down ~~cooling~~-characteristics is executed based upon a zone of the physical amount,

Claim 33 (Currently Amended) The refrigerating storage cabinet of claim 31, wherein the appropriate one of the plurality of the pull down ~~cooling~~-characteristics includes a small temperature drop degree when a difference between the physical amount and the target physical amount is less than a predetermined ~~value~~amount; and

wherein the appropriate one of the plurality of the pull down cooling characteristics includes a large temperature drop degree when the difference between the physical amount and the target physical amount is greater than or equal to the predetermined amount.

Claim 34 (Currently Amended) The refrigerating storage cabinet of claim 31, ~~characterized in that~~ wherein the plurality of the pull down ~~cooling~~-characteristics includes an auxiliary cooling characteristic comprising a temperature curve in which a convergence temperature remains at a temperature higher by an auxiliary predetermined value than the set internal temperature; and

wherein the auxiliary cooling characteristic is selected as the appropriate one of the plurality of the pull down ~~cooling~~-characteristics when a difference between the physical amount

and an evaporation temperature of the evaporator is at or above a predetermined auxiliary temperature value or when the physical amount is higher than the target physical amount by at the predetermined auxiliary temperature value.

Claim 35 (Currently Amended) A refrigerating storage cabinet for refrigerating an inner atmosphere and including a refrigeration unit ~~comprising including~~ a compressor and an evaporator, the compressor including a plurality of performance levels, in which the refrigerating storage cabinet comprises comprising:

a storing ~~means for storing~~ unit configured to store a plurality of cooling characteristics ~~comprising including~~ a target physical amount as a function of operating time;

a physical amount sensor ~~able~~ configured to detect a physical amount, ~~corresponding to the target physical amount,~~ at predetermined intervals of operating time; and
~~wherein the compressor comprises a plurality of performance levels;~~

an operation control ~~means for controlling~~ unit configured to control the compressor by selecting ~~an appropriate~~ one of the plurality of performance levels based upon a relationship between the physical amount and the target physical amount for one of the predetermined intervals of a corresponding operating time;

wherein the operation control ~~means~~ unit is configured to select ~~selects an appropriate~~ one of the plurality of cooling characteristics based upon the physical amount; and

wherein the target physical amount is determined from the ~~appropriate~~ one of the plurality of cooling characteristics.

Claim 36 (Currently Amended) The refrigerating storage cabinet of claim 35,

wherein:

the physical amount is a temperature of the inner atmosphere; ~~and~~

the target physical amount ~~are temperatures~~ is a temperature;

~~wherein the physical amount is the temperature of the inner atmosphere;~~

~~wherein the compressor is controlled by the operation control means in which the cooling characteristic is a pull down characteristic while the physical amount is in a temperature range~~

from above a high temperature to near a set temperature; and

~~wherein the high temperature is higher than the set temperature by more than a~~
predetermined value;

said refrigerator storage cabinet further comprising:

an upper limit temperature that is higher by the predetermined value than a set temperature;

a lower limit temperature that is lower by the predetermined value than the set temperature; and

a control-cooling zone between and including the upper limit temperature to the lower limit temperature;

wherein when the physical amount is in the control-cooling zone, the cooling characteristic is a control-cooling characteristic;

~~wherein the compressor is controlled by the operation control means wherein the control~~
characteristic is a control-cooling characteristic when the physical amount is in the control-cooling zone from the upper limit temperature to the lower limit temperature;

wherein when the physical amount reaches the lower limit temperature from a temperature higher than the lower limit temperature, the compressor is not operated; and

wherein when the physical amount reaches the upper limit temperature from a temperature lower than the upper limit temperature, the compressor is operationally controlled by the operation control ~~means~~unit.